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Refereed paper

Perceptions on the quality of records received via the GP2GP electronic transfer service: pilot online questionnaire study

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ABSTRACT

Aim To obtain insight into the perceived quality of electronic records received by GP2GP transfer, from the perspective of staff within the receiving practice.

Methods A pilot study using a self-completion online survey. We used textual analysis and descriptive statistics to report the findings.

Results Respondents considered a significantly higher proportion of their own records to be accurate, complete and useful compared with records transferred from other practices ($P<0.0001$). However, very few respondents felt that a large proportion of records were fully inaccurate, incomplete or useless. Perceived accuracy, completeness and usefulness were positively associated with the proportion of electronic records requiring no modification when reconciled with paper records, and negatively associated with the proportion of records requiring major additional information when reconciled with paper records. There were no significant differences in perceived accuracy or completeness of GP2GP records according to which brand of GP electronic patient record system was used.

Conclusion The results suggest that respondents value the GP2GP record transfer system. They perceive issues with record quality, which require significant resources to rectify. Textual analysis suggests that difficulties in mapping data structures between systems may underlie some of the perceived issues. Further research is needed to confirm these initial findings on differential perception and explore their underlying causes.

Keywords: electronic patient records, perceptions, quality

What this paper adds

Preliminary information on:

- Perception of the quality and usefulness on UK GP EPRs transferred to another practice via GP2GP record transfer as a means of assessing the quality of GP EPRs in general.
- Information on how practices manage records, both paper and electronic, received when a patient enters the practice identification of areas of concern deserving further study.

Introduction

'Information Revolution'[1] is one of a series of consultation documents published subsequent to the coalition government's White Paper, *Equity and Excellence: Liberating the NHS*,[2] about transforming the way information is collected, accessed, analysed and used so that people are at the heart of health and adult social care services. This suggests a need for high-quality data on health accessible through electronic patient record (EPR) systems,[3–5] which emphasises that integrated 'seamless care is difficult to achieve without seamless information' (p. 579).[6] GP2GP is an important project which enables the EPR to be transferred securely and directly to a new practice when a patient registers at that practice.[7] Despite the extensive use of EPRs in general practice in the UK and the fact that many practices regard themselves as being 'paperlite', i.e. having the entire patient record held electronically, little is known about the quality of those records.[8,9] Such information as there is appears to relate mainly to data quality in the entire clinical database, rather than individual patient records as separate entities, and most recently comes from data accreditation supervised by Primary Care Information Services (PRIMIS+) delivered as part of the Information Centre (IC) for Health and Social Care's services. Whilst data accreditation standards underpinned the information management and technology directed enhanced service (DES) (2006–2009), notably, only 70% of practices in England engaged with this initiative and no information is available on the data quality in the remaining 30%. Little is currently known about receiving practices' perceptions to the quality of individual patient records received via GP2GP.

Individual patient care is increasingly being delivered in numerous settings, and there is an increasing need for safe and automated sharing of individual patient information to support integrated care. For this to be safe and fully effective, some knowledge of the quality of the information being shared is essential, to enable agreement on standards, provide training and, where necessary, educate the end-users of the information about the current limitations, as well as the advantages.

GP2GP is an important project which enables the EPR to be transferred securely and directly to a new practice when the patient registers at that practice. Since 2007, the project has transferred and received records between practices using EMIS and INPS systems, providing a potential source of information about the quality and fitness for purpose of these records – to incorporate the entire received record into the practice database (with little or no need to add or correct information obtained from the paper records).[7]

The literature on electronic health/patient records, GP2GP, perceptions and quality was reviewed to establish an appropriate theoretical and methodological base to the study. Major bibliographic databases and grey literature were searched during the first quarter of 2011 using the following key words: electronic health/patient records, GP2GP, perceptions and quality. Twenty-three papers commented on perceptions of quality, 38 studies measured data quality in primary care computer systems and three articles referred to GP2GP record-transfer systems. We found little evidence about the quality of electronic patient records in primary care, such information as there is appears to relate mainly to data quality in the entire clinical database rather than individual patient records as separate entities. The majority of relevant studies are categorised as descriptive surveys; moreover, 'the appraisal of data quality has favoured the selection of practices that embrace technology – consequently, the EPR quality reported is likely to be an over estimate of the general picture'.[8] We measured perceptions of three aspects of data quality: accuracy, completeness and usefulness. This is within the UK context where researchers understand the importance of the quality of EPR data in terms of health policy, record linkage and research databases that include the Doctors Independent Network (DIN), General Practice Research Database (GPRD), QResearch and The Health Improvement Network (THIN).

The literature suggests that perceptions of the impact on workload and outcomes are significant factors in determining the use and adoption of systems. Understanding this dynamic, as it relates to readiness for technological change, is useful in appreciating predicted changes to workflow and care delivery processes when implementing and exploiting the potential of new systems.

Methods

This paper presents the results of a pilot study undertaken in spring 2011 exploring perceived quality of records received via GP2GP. The results are informed by a review of the literature and the findings derived from a self-completion survey to determine the quality of records received via the GP2GP electronic record transfer system from the perspective of those engaged in the receiving practice. Textual analysis was performed on the free text comments of respondents using a tool devised by the team which counts the occurrences of words and phrases contextualising these within the sentences where they occur.

The online survey was designed and completed using SurveyMonkey©.[10] Full details of the survey

questionnaire can be found in the online supplementary data file. Basic information sought included the role of the respondent in the practice, size of practice, estimated list turnover, type of practice system and details of relevant internal processes. Perceptions of accuracy, completeness and usefulness of electronic records were sought separately for the records generated in the respondents' own practice, and for GP2GP records incoming from other practices. Respondents were asked to estimate the proportion of records (in four categories, coded 1–4: 0–25%, 26–50%, 51–75% and 76–100%) in each of four broadly defined levels of the relevant concept, for example, accurate, mostly accurate, mostly inaccurate, inaccurate (coded 1–4, respectively). For the sake of brevity we present results for the two extreme categories only (accurate and inaccurate, complete and incomplete, useful and not useful). These were expected to show the greatest contrasts when comparing their own electronic records and GP2GP records. Respondents were also asked about the process of reconciling patient information received electronically via GP2GP with that obtained from paper records received subsequently. Specifically they estimated the proportion of electronic records (in four categories) that required respectively: (1) no modification, (2) reorganisation but no additions and (3) major additions. In addition, they were asked to estimate how often certain practices were used to manage the summarising of incoming electronic records, for example, how often are incoming records summarised by clinically trained staff, with possible responses being: never, sometimes, most of the time, always. Data were downloaded and imported into Stata 11[11] for further analysis. Simple frequencies and cross-tabulations were presented. Comparisons of proportions were conducted using the chi-squared test or Fisher's exact test (where predicted cell numbers were small). Spearman's rank correlation coefficient was used to assess associations between ordinal variables with four levels (e.g. the proportion of records perceived to be accurate versus how often incoming records are summarised by clinically trained staff). Respondents were asked to share their observations regarding records received via GP2GP. Their responses were analysed using a textual analysis software tool developed by the investigating team, 'Bookworm'. This is an Access database which splits the text into sentences and counts the occurrence of words within those sentences which are then displayed in either alphabetical or frequency order. Chosen words or combinations of words can then be shown in the context of their originating sentence.

Results

There were 147 responses from 146 different general practices. Of the respondents, 48 (33%) were general practitioners (GPs), 52 (35%) were practice managers, 22 (15%) were note summarisers and 25 (17%) had other roles, mainly as information or data managers. The majority (44%) of responding practices had a list size of 5000–10 000, while 31% were larger and 25% were smaller. The majority of respondents (54%) estimated their annual list turnover at between 5 and 10%, with 26% reporting lower turnover and 20% reporting higher turnover. The type of practice system was missing for eight respondents. Of the remainder, the brands of EPR system used by respondents were as follows: 35 (25%) used EMIS (www.emis-online.com), 103 (74%) used InPS (www.inps4.co.uk), and one reported using iSOFT (www.isofthealth.com), which does not currently support GP2GP: this respondent only commented in relation to their practice records and processes. Use of a standard GP2GP import protocol was reported by 73% of practices and 90% had participated in some form of data accreditation exercise: the information management and technology DES or a local enhanced service.

Perceptions of relative accuracy and inaccuracy of own versus GP2GP records are shown in Figure 1a and b respectively. A much larger proportion of records generated in the respondents' own practice were considered to be fully accurate, compared with records transferred via GP2GP, and this difference was highly significant (chi-squared, $P < 0.0001$). For both kinds of records, most respondents reported that only a minority of records were fully inaccurate, and there was no significant difference in the perceptions of own and GP2GP records.

Perceived completeness (Figure 1c) showed very similar patterns with significantly higher levels of completeness attributed to records generated in the respondents' own practice (chi-squared $P < 0.0001$), but in addition, levels of incompleteness (Figure 1d) were felt to be higher for GP2GP records compared with own practice records (chi-squared $P = 0.01$).

Perceived usefulness (Figure 1e) showed very similar patterns to perceived accuracy and completeness, being significantly greater for records generated in the respondents' own practice ($P < 0.0001$). There were no significant differences in the proportions of records considered to be not useful (Figure 1f).

Table 1 gives a summary of the measures adopted to check incoming GP2GP records to maintain data quality. This confirms that considerable effort is expended in checking and amending incoming GP2GP records.

Perceived levels of accuracy, completeness and usefulness of incoming GP2GP records were not

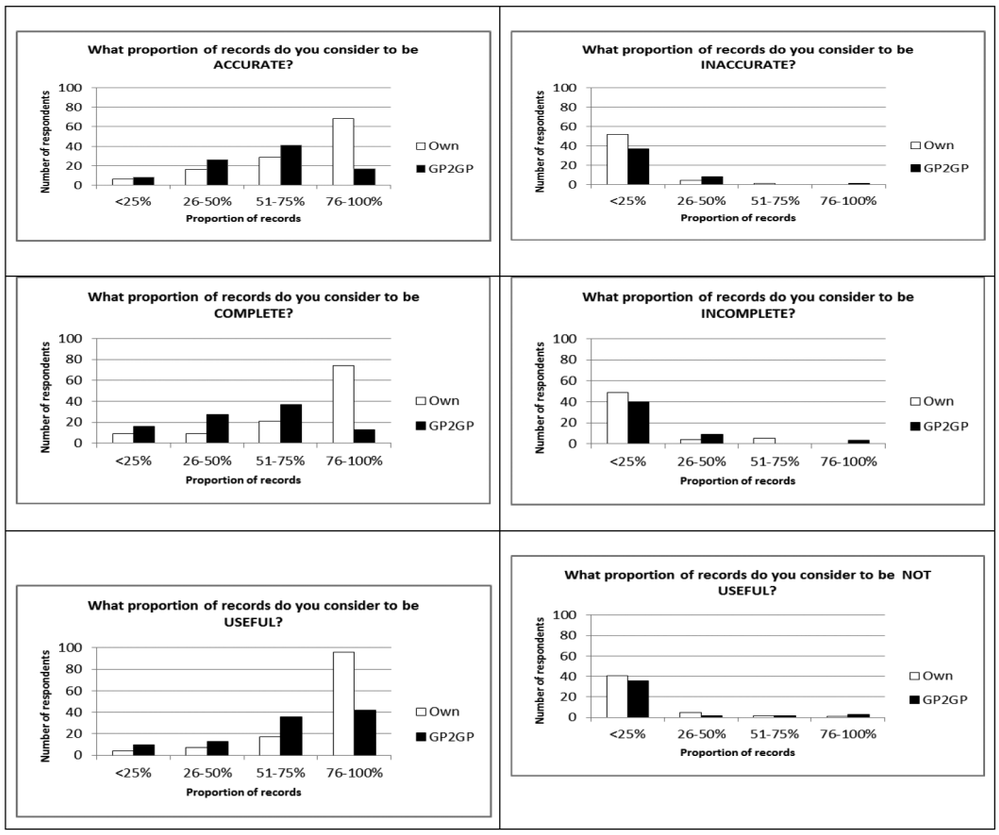

Figure 1 Perceptions of relative accuracy, completeness and usefulness of electronic records generated in respondents own practices (white bars) and those received via GP2GP (black bars)

Table 1 Measures adopted to ensure quality of incoming GP2GP records

Measure	How often is this done: number (%)			
	Never	Sometimes	Most of the time	Always
Incoming records summarised by trained summarisers	8 (6.2)	6 (4.6)	8 (6.2)	108 (83.1)
Summarising conducted by clinically trained staff	32 (24.8)	25 (19.4)	15 (11.6)	57 (44.2)
Records checked before import to practice record	46 (35.1)	14 (10.7)	16 (12.2)	55 (42)
GP2GP record reviewed when paper record received	3 (2.2)	13 (9.6)	15 (11.1)	104 (77)
Records entered and reviewed by same staff	19 (15)	21 (16.5)	22 (17.3)	65 (51.2)

associated with measures adopted for reconciling electronic and paper records (Table 2), except for a relatively weak association (rank correlation coefficient 0.23, $P = 0.03$) between completeness and the frequency with which incoming GP2GP records were reconciled with paper records. However, levels of accuracy, completeness and usefulness were positively associated with the proportion of electronic records requiring no modification when reconciled with paper records. Even stronger negative correlations were seen between levels of accuracy, completeness and usefulness and the proportion of records requiring major

Table 2 Spearman's rank correlation coefficients for associations between perceived accuracy/completeness/usefulness of GP2GP records

	Accuracy[a]	Completeness[a]	Usefulness[a]
In managing and summarising incoming records, how often are the following practices adopted:			
Incoming records summarised by trained summarisers[b]	–0.02	0.03	0.02
Summarising conducted by clinically trained staff[b]	0.11	–0.02	0.06
Records checked before import to practice record[b]	–0.13	–0.12	–0.03
GP2GP record reviewed when paper record received[b]	0.16	0.23*	0.1
Records entered and reviewed by same staff[b]	0.15	0.13	0.01
When reconciling incoming GP2GP record with paper record, what proportion require the following:			
No modification[a]	0.27*	0.22*	0.40**
Reorganisation only[a]	0.11	0.05	0.22*
Major additional information[a]	–0.52**	–0.45**	–0.56**

[a] Coded as 1 = 0–25%, 2 = 26–50%, 3 = 51–75%, 4 = 76–100%. [b] Coded as 1 = Never, 2 = Sometimes, 3 = Most of the time, 4 = Always. * $P < 0.05$; ** $P < 0.0001$.

additional information when reconciled with paper records.

Perceived levels of accuracy, completeness and usefulness did not vary systematically according to other practice characteristics, or the role of the respondent.

Seventy-five respondents chose to share their observations regarding records received via GP2GP. The most commonly occurring concepts within the text, and examples of actual verbatim comments are given below.

'Time' – 14 occurrences:

- Waste of summariser's time.
- Degraded records can take a great deal of time to edit without actually adding much in the way of information.
- Duplicate entries, still not a large percentage coming through GP2GP (perhaps this is an advantage), EMIS workflow manager slow, a lot of rejections, etc. which just need ending/filing so a bit of a waste of time.
- Sometimes scanned attachments (documents) from other practices are unable to be opened by our clinical system meaning we have to rescan and reattach the documents which is a lengthy process.
- These are time consuming to transcribe into Read-coded items.
- No money for conversions – no time/staff to do it! Priorities and problems do not work together well!

'Problem' – 13 occurrences:

- There is still a MAJOR problem with attachments/scanned not opening so cannot be read.
- Records received when previous practices use priority codes leads to very messy summary/problem title pages and as we run problem summary pages this usually involves a great deal of reorganising the summary pages and there can be a lot of duplication of Read codes.
- Invaluable – but there are problems of differences in structure between systems and some cases of omissions of major items contained in the paper record.
- Problems arise when different systems use different ways to (1) prioritise data, (2) record administration.
- InPS Vision uses priorities, EMIS is problem based.

'Degradation' – 12 occurrences:

- Degraded records can take a great deal of time to edit without actually adding much in the way of information.
- There are a lot of degraded results (bloods, X-rays, etc).
- If they come from the same system then can tidy up, when from other systems a lot is degraded, priority systems vary so that duplication is common and Read codes often entered looking like notebook entries.
- A huge amount of work to clean up the degraded entries.
- Degraded Read codes with a valid Read code description just confuse people.
- Degraded records handling is esoteric.
- To be able to build a degraded code mapping list similar to that used on lab results so I do have to keep changing the same codes on each patient.

'Information' – 8 occurrences:

- Significant reduction in lost information as result of patient transfer.
- The information received from previous practices always transfers into incorrect data fields, requiring total deletion and re-correction.
- Degraded records can take a great deal of time to edit without actually adding much in the way of information.
- Lots of notepad entries (many without any information). Many immunisations need re-adding.
- Have taken a lot of the grief away – and speed on arrival excellent. Non-coding an issue – but rarely significant – most of this information of little long-term significance and free text search can find.
- It is too much work to convert most of the information to a Vision friendly format! Only a few key diagnoses are converted – for the rest, we leave people to search in the records when clinical circumstances permit.

'Priority' – 6 occurrences:

- Records received when previous practices use priority codes leads to a very messy summary/problem title pages and as we run problem summary pages this usually involves a great deal of reorganising the summary pages, there can be a lot of duplication of Read codes also.
- Wish they were all in the same format, e.g. using priority codes, some use notepad with no Read code.
- There need to be an agreement on priority codes.
- Why has no one standardised the use of priority levels?
- Electronic consultation records received do not use constant priority coding, if any.

'Attachments' – 4 occurrences:

- There is still a MAJOR problem with attachments/scanned not opening so cannot be read.
- Often other systems do not use 'Priorities' when entering a diagnosis as we do and in the case of attachments often they do not open in our system or worse an attachment is created in our system that was not recorded by the previous surgery resulting in a need to make phone calls to previous surgery to clarify.
- Emis Practices no priorities and we cannot read attachments.

'Immunisations': 3 occurrences:

- A lot of the time the immunisations are coming down as History Adds NOT actual Imms so these need changed a lot, also a lot of History Adds come down as notepad entries so need manually entered correctly.
- The main problem is data from surgery's using different systems, i.e. editing data they have recorded, immunisations recorded as consultations and not appearing as immunisations.
- Many immunisations need re-adding.

In summary, the main themes emerging from these observations seem to relate to problems arising from a lack of standardisation, both in terms of data structure of records held in different clinical systems and in the way those systems are used in individual practices. These issues appear to be a function of the different clinical systems underlying structures and features rather than as a result of the transcription process.

Discussion

Principal findings

This paper presents the results from a pilot study undertaken in spring 2011 exploring perceived quality of records received via GP2GP.

Transferred records are perceived to be less accurate, complete and useful than their own-practice-generated records. It is unlikely that this is purely a result of cognitive bias of illusory superiority.[12]

Implications of the findings

There were no significant differences in perceived accuracy or completeness of GP2GP records according to which GP system was used. This suggests that

the problem resides in the existence of multiple GP systems, and/or lack of standards in record structure and content, rather than with a specific system. If confirmed, this finding suggests that these problems may be compounded when other GP systems with different data structures become GP2GP compliant. Work on developing standards for the structure and content of records may therefore be particularly pertinent.[13]

The effect of incomplete and inaccurate GP2GP records on incoming practice processes – pressures of time, resources and workload were frequently mentioned issues. The implications for management are that there needs to be an awareness of techniques that optimise the process and to monitor the impact and competition for resources from within the system.

Comparison with the literature

This is the first published study into the perceived quality of GP2GP records.

Limitations of the method

It would be expected that the amount of effort needed to incorporate the incoming GP2GP record would be inversely related to the overall quality of the record, and this is consistent with the findings of the correlation analysis.

Despite the perceived limitations, very few respondents felt that a large proportion of GP2GP records were fully inaccurate, incomplete or useless. Practices seem to consider that having a record, even if the quality may be dubious, is preferable to waiting for receipt of the paper record and getting it summarised. This provides grounds for optimism. Presumably, satisfaction with the record quality will increase as the resources required to check and amend incoming records decrease.

Call for further research

Further research (including a larger survey) will be needed to tease out the various factors that lead to this perception of lower quality. In this respect, the textual analysis indicates that transfer between different systems may be particularly problematic. Different systems such as EMIS and InPS utilise different underlying data models and structures, which can lead to difficulties when mapping data from one system to another. Although data may not be lost in the mapping process, it may need to be transferred as free text which is more difficult to locate, search and index.

Perceptions of inaccuracy, as opposed to incompleteness, are difficult to evaluate from this survey and may benefit from further study. If the perception is correct, there could be a significant proportion of inaccurate records which have not yet been transferred via GP2GP extant within GP systems. This has implications for data quality and potentially patient safety.

Conclusions

The value of the records transferred via GP2GP system was recognised. However, there were perceived to be significant problems with record quality. Preliminary findings suggest that transfer of records between different systems may be an issue. If this is the case then the current work on the development on standards for the structure and content of records may provide a solution.

The information on management of records received by the practices is reassuring: 83% always have trained summarisers working on incoming records, and although 46% never review the GP2GP record before importing it, 77% check the GP2GP record against the paper record when the latter is received, and a further 11.1% do this most of the time.

GP records tell an evolving story. Perceived inaccuracies may reflect survivals of evolved diagnoses, false information or omissions of significant information. This study has not attempted to address the question of the degree to which those areas of quality as perceived impact on patient care. This is a pilot study using a self-selected group of respondents, and any conclusions drawn must therefore be tentative. A potential limitation of the survey is the use of four broad categories. Because this was a pilot and we were interested in perceptions, there was some deliberate vagueness of the definitions of the levels as we did not know what to expect. The findings suggest directions for future study.

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CONFLICTS OF INTEREST

The study was conducted in accordance with UCLan's ethical framework – Faculty of Health Ethics Committee. All authors have completed the Unified Competing Interest form at www.icmje.org/coi_disclosure.pdf and declare that (1) BE, JH, DD and MH have support from UCLan for the submitted work; (2) BE, JH, DD and MH have no relationships with NHS Information Centre for Health and Social Care in the previous 3 years; (3) their spouses, partners or children have no financial relationships that may be relevant to the submitted work; and (4) BE, JH, DD and MH have no non-financial interests that may be relevant to the submitted work; (5) MH is a member of the GP Extraction Service group at NHS Information Centre.

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